***Ab initio* M1 observables in the *p*-shell with consistent χEFT-improved operators**[1] PATRICK J. FASANO, MARK A. CAPRIO, University of Notre Dame, SHIPLU SARKER, SOHAM PAL, ROBERT BASILI, PIETER MARIS, JAMES P. VARY, Iowa State University — *Ab initio* methods in nuclear theory strive to make quantitative predictions of nuclear observables, starting with the internucleon interaction. Modern interactions, such as the LENPIC interaction, are derived systematically from chiral effective field theory (χEFT). However, the same χEFT treatment used for deriving the potential can be used to derive consistent effective operators for electromagnetic moments and transitions. We have derived the effective M1 operator, consistent with the LENPIC interaction up to N2LO in the chiral expansion, and apply it within the no-core configuration interaction (NCCI) approach for a variety of nuclei in the *p*-shell. We present preliminary results for magnetic moments and M1 transition matrix elements, and explore convergence behavior of the χEFT corrections.

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